CELLULAR TELEPHONE NETWORK HAVING SHORT MESSAGE SERVICE INTERACTION WITH OTHER NETWORKS

BACKGROUND OF THE INVENTION

1. Technical Field of the Invention

The present invention relates to cellular telephone networks and, in particular, to a cellular telephone network providing for inter-network short message service (SMS) message transmissions.

2. Description of Related Art

In accordance with TIA/EIA Interim Standards 41 and 136 hereinafter referred to as the "IS-41 and 136 Specifications", provision is made for using a short message service (SMS) message to transmit text (i.e., alphanumeric) messages between mobile stations, base stations and mobile switching centers in a cellular telecommunications network. To facilitate this service, the cellular network includes a message center (often located in the mobile switching center itself) to store SMS messages, initiate the transmission of SMS messages to mobile stations and receive SMS messages transmitted from mobile stations. Use of SMS messages is also authorized by the IS-41 and 136 Specifications for the transmission of text messages between two mobile stations over the cellular telecommunications network via the message center (i.e., an intra-network message communication).

Today's society demands access to and communication over, among and between multiple networks such as a local area network (LAN), wide area network (WAN), conventional telephone network and cellular telephone network. While the current IS-41 and 136 Specifications adequately handle the transmission of text messages using SMS message transmissions within the cellular telecommunications network itself, the specifications fail to address the need for text message transmission between the cellular network and other networks (like the conventional telephone network, LAN or WAN) in the form of inter-network communications. The failure of the IS-41 and 136 Specifications to facilitate such inter-network message communications comprises a serious drawback to the specifications that has not yet been addressed by the art or the specification committee.

A crude and inefficient solution to this deficiency, which does however operate within the current IS-136 Specification boundaries, involves assignment of a human operator to the message center to handle the passage of messages between the cellular network and various other networks over which communication may be desired. In accordance with this solution, when a subscriber initiates an inter-network SMS text message at a mobile station and transmits the message to the message center, the human operator then reformats the message for transmission over another network (using a facsimile or e-mail transmission) and attends to the delivery of the message to a third party over that network. Alternatively, when a third party initiates an inter-network message on another network for transmission to the message center, the operator then reformats the message for network transmission (using an SMS message transmission) and attends to the delivery of the message to a certain subscriber mobile station over the cellular network.

There is accordingly a need for a method and system for allowing cellular subscribers to both initiate and receive inter-network message transmissions without invoking human operator interaction or intervention. In particular, there is a need for an automated system and method for facilitating inter-network message communication between

mobile station subscribers on a short message service supported cellular network and users of other networks which may be connected thereto.

SUMMARY OF THE INVENTION

The present invention addresses the current inter-network message communication limitations presented by the IS-41 and 136 Specifications for cellular telephone networks by including a functionality in the message center of the cellular telecommunications network that facilitates inter-network message communications. With respect to an SMS message originated by a mobile station, the functionality of the message center analyzes the received message to identify both a designated message delivery network and a destination address on that designated network for message delivery. The received message is then re-formatted (if necessary) for transmission on the designated network, and forwarded in the proper format to the identified destination address via the designated network. With respect to a message originated on a network other than the cellular network, the message center analyzes the received message to identify a subscriber mobile station destination on the cellular network for message delivery. The received message is then re-formatted (if necessary) for transmission on the cellular network, and forwarded in the SMS message format to the identified subscriber mobile station via the cellular network.

In order for the message center to identify the desired network and addressee destination for delivery of the received message, a destination identifier is added to the text field of the originated message. The destination identifier includes both a network designation (identifying the network over which the received message is to be transmitted) and a destination address (identifying the addressee on the designated network to which the received message is to be delivered). For example, a message originated by a mobile station and intended for facsimile delivery to a certain person will include a destination identifier in the text field comprising a network designation of a conventional telephone network and a destination address of that certain person's facsimile telephone number on the telephone network. Similarly, a message originated by the mobile station and intended for e-mail delivery to a certain user will include a destination identifier comprising a network designation of the user's local or wide area network (LAN or WAN) and a destination address of the user's network address on the LAN or WAN. For messages originated outside the cellular network as a facsimile or e-mail and intended for delivery to a cellular subscriber, the text field will include a destination identifier comprising a network designation of the subscriber's cellular network and a destination identifier of the subscriber's mobile station telephone number on the cellular network.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the method and apparatus of the present invention may be had by reference to the following Detailed Description when taken in conjunction with the accompanying Drawings wherein:

FIG. **1** is a block diagram of a cellular telecommunications network implementing the inter-network communications functionality of the present invention;

FIGS. **2A–2D** illustrate message formats for transmitting inter-network messages in accordance with the present invention; and

FIG. **3** is a flow diagram illustrating operation of the present invention for handling an inter-network message received in one of the formats of FIGS. **2A–2D**.